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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/944,284

08/31/2001

Jon A. Casey

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(IFI-10-5)

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06/04/2003

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EXAMINER

HARAN, JOHN T

ART UNIT

PAPER NUMBER

1733

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/944,284

Applicant(s)

CASEY ET AL.

Examiner

John T. Haran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1–9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is indefinite because the claim refers to openings, via openings and index openings. When the term “openings” is used it is unclear which type of opening is be referred to: via or index. It is suggested to amend the claim to specify the type of opening at each use of the term. In claim 1, lines 5-7 the phrase “and wherein the via openings in each subcomposite structure are positioned to align with an opening in at least one opening in a subcomposite structure that is to be adjacent said each subcomposite structure” is confusing and it appears it should read - - and wherein the via openings in each subcomposite structure are positioned to align with an opening in at least one subcomposite structure that is to be adjacent said each subcomposite structure - -. It is also noted that it appears the word - - in - - should be inserted in line 12 before the word “each” and it appears that the phrase “adjacent subcomposite structure” in line 21 should read - - adjacent superimposed structures - -. Additionally it is noted that the preamble is directed to making a printed wiring structure of a plurality of at least three superimposed subcomposites and the step of provide subcomposite

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structures should be amended to read - - providing a plurality of at least three organic dielectric subcomposite structures - -.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bross et al (U.S. Patent 5,517,751) in view of Kawakita et al (U.S. Patent 5,817,404) and Pommer (U.S. Patent 6,560,844).

Bross et al is directed to a method of making a multilayer wiring module wherein a plurality thermoplastic polymer sheets (organic dielectric subcomposite structure) with metal filled vias and printed wiring pattern, the sheets are coated with a polyimide (adhesive), the sheets are stacked and aligned so that vias of adjacent sheets are aligned together and then the stack is laminated together to adhesively bond the sheets together and join the metal fillings of aligned vias together (Column 1, line 40 to Column 2, line 11; Column 3, lines 49-53; and Figures 3-4). It is noted that Bross et al is silent towards the polyimide adhesive not being placed on the via fillings, however one skilled in the art would have readily appreciated that the adhesive coating has openings for the vias in order to allow for the fillings to join together.

Bross et al is silent towards having curable conductive paste filled vias. One skilled in the art would have readily appreciated that the vias must be filled with

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conductive material and that metal and curable conductive paste are alternate expedients that are obvious over one another. Furthermore it is well known and conventional in the art to fill vias in a sheet with curable conductive paste that extends beyond the face of the sheet, to stack a plurality of sheets together so that the filled vias are aligned and a cured and joined together to provide electrical connection between the layers, as shown for example in Kawakita et al (Column 7, lines 50-55; Figures 4A-B). One skilled in the art would have readily appreciated using obvious alternate material for the via filling such as conductive paste in the method of Bross et al as suggested in Kawakita et al.

Bross et al is teaches aligning the sheets so that the vias are aligned when stacking the sheets but is silent towards having index openings in the sheets for aligning the sheets by laying up the sheets in superimposed relationship on a fixture. It is well known and conventional in art when forming multilayered articles that need proper alignment of the layers to have index openings in each sheet and to lay the sheets on a fixture through the index openings so that the stack is properly aligned, as shown for example in Pommer (Column 1, lines 10-17; Figure 1). One skilled in the art would have readily appreciated using conventional alignment techniques in the method of Bross et al as suggested in Pommer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to fill the vias with conductive paste material extending beyond the face of the sheets, to provide index openings in the sheets for alignments, to lay up the sheets with the adhesive coating on a fixture so that the vias of adjacent superimposed

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sheets are in alignment, and laminating the stack to cure the conductive paste and adhere the sheets together in the method of Bross et al as suggested in Kawakita et al and Pommer.

Regarding claim 2, one skilled in the art would have readily appreciated that adhesive can be applied in numerous forms, including as a coating or a sheet, and that they are alternate expedients obvious over one another. It would have been obvious to use an alternate expedient or form of adhesive such as an adhesive sheet in the method of Bross et al, as modified above.

Regarding claims 3-5, one skilled in the art would have readily appreciated that it vias are either plated or not plated and that the presence of plating depends upon a variety of factors such as the materials worked upon and the intended use for the finished composite. It would have been obvious to have plated, unplated, or a combination of plated and unplated vias in the method of Bross et al, as modified above.

Regarding claim 6, one skilled in the art would have readily appreciated partially curing or drying the conductive paste prior to lamination so that the paste did not drip or flow all over during assembly. It would have been obvious to do so in the method of Bross et al, as modified above.

Regarding claims 7-9, one skilled in the art would have readily appreciated that it is common practice to fill vias or apply circuitry through a mask and it would have been obvious to do so in the method of Bross et al, as modified above.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lauffer et al (U.S. Patent 6,388,204) teaches filling vias with conductive paste, aligning and stacking the layers so vias of adjacent layers are aligned and laminating them together, but there is no suggestion of applying adhesive between the layers.

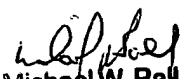
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John T. Haran** whose telephone number is **(703) 305-0052**. The examiner can normally be reached on M-Th (8 - 5) and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael W. Ball can be reached on (703) 308-2058. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


John T. Haran

May 29, 2003


Michael W. Ball
Supervisory Patent Examiner
Technology Center 1700